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The unique solvability of certain multiplicative-convolution equations

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Abstract

In the class of distributions of slow (moderate) growth we consider a class of equations with operations of convolution and multiplication on the real axis. This class contains convolution equations, in particular, ordinary differential equations with constant coefficients, equations in finite differences, functional differential equations with constant coefficients and shifts, and pair differential Bequations. By virtue of the analytic representation theory for distributions of moderate growth (the Hilbert or Cauchy transform) the class of equations under consideration is equivalent to the class of boundary value problems of the Riemann type, where an equation corresponds to a boundary value condition in the sense of distributions of moderate growth. As a research technique we use the Fourier transform, the generalized Fourier transform (the Carleman-Fourier transform), and the theory of convolution equations in the space of distributions of moderate growth. © 2012. Allerton Press, Inc.

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Keywords

Analytical representation of distributions, Carleman-Fourier transform, Convolution algebras and moduli, Convolution equation, Distributions of slow (moderate) growth, Fourier transform, Space of convolutors for space of distributions of slow growth